ANNUAL REPORT FOR 2002

Cedar Point Mitigation Site
Carteret County
Project No. 6.16901T
TIP No. R-2105 AB

Prepared By:
Office of Natural Environment & Roadside Environmental Unit
North Carolina Department of Transportation
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SUMMARY

The Cedar Point Mitigation Site, located in Carteret County, serves as mitigation for marsh impacts within the White Oak River Basin. Located adjacent to NC 24, the site was constructed in 2002 and is in its first year of monitoring following construction. The site was monitored in 2002 for both hydrologic and vegetation success.

Hydrologic monitoring consisted of examining the data from two onsite surface gauges. Because the site receives its primary hydrologic input from an onsite channel that is connected to open water, the criteria for hydrologic success is based on site flooding. The site must be flooded twice daily and be flooded with the same frequency and duration as adjacent marsh systems. The 2002 data showed that the site flooded twice daily, and that the site did so in average climatic conditions.

Vegetation monitoring indicated vegetation failure on the site. Though the final percent frequency and percent cover values were not calculated, the site indicated minimal vegetative cover. Following an examination into the vegetation failure, NCDOT has plans to replant the site in 2003.

Hydrologic monitoring will continue in 2003. Following the replanting of the site, NCDOT will begin new vegetation monitoring.

1.0 INTRODUCTION

1.1 Project Description

The Cedar Point Mitigation Site is located in Carteret County adjacent to both NC 24 and the White Oak River (Figure 1). The site is designed as an emergent marsh; a constructed channel within the site promotes tidal exchange within the mitigation area. The Cedar Point site provides mitigation to offset impacts from improvements to NC 24 as well as for future impacts in the White Oak River basin.

1.2 Purpose

In order to demonstrate successful mitigation, both the hydrologic and vegetation conditions of a new site must be monitored. This report details the hydrologic and vegetation monitoring on the Cedar Point Mitigation Site in 2002; this is the first year the site has been monitored following construction.

1.3 Project History

March-May 2002	Site Construction
May 2002	Site Planted
June 2002	Surface Gauges Installed
June-December 2002	Hydrologic Monitoring (1 yr.)
August 2002	Vegetation Monitoring (1 yr.)

Figure 1. Site Location Map

2.0 HYDROLOGY

2.1 Success Criteria

Though most mitigation sites are monitored according to federal wetland hydrologic criteria, NCDOT and cooperating agencies decided that the Cedar Point Mitigation Site should be judged according to different criteria. This is due mainly to the fact that the site is located on the coast and receives its main hydrologic input via a channel that originates at an open-water location. The site's flooding regime, if it is consistent with that outside the mitigation area, will determine hydrologic success. The site must be flooded twice daily and have the same elevation and duration as flooding outside the mitigation area in order to be considered successful. The site will be monitored for three years or until success criteria are met. Local rainfall is monitored to ensure site success in average local climate conditions, though rainfall is not the primary hydrologic input.

2.2 Hydrologic Description

Due to the site's proximity to the White Oak River as well as the constructed channel designed to increase tidal exchange, the Cedar Point site is monitored only by surface water gauges. These gauges should indicate if the site is flooded twice daily as is required for success. The flooding regime of the site is expected to be the same as that measured for the biological benchmarks for *Spartina alterniflora*, since it can reflect long-term tidal fluctuations. Because surface water is the major hydrologic input for this site, a rain gauge was not installed.

2.3 Results of Hydrologic Monitoring

2.3.1 Site Data

Appendix A contains plots of data recorded at both of the surface gauges on the site. Both of the gauges indicate the consistent presence of surface water on the site throughout the remainder of the growing season.

Figure 3 is a surface water plot of the data recorded at both gauges over a two-day period (selected at random). As the graph indicates, the site experiences flooding twice daily, as is required in the mitigation plan.

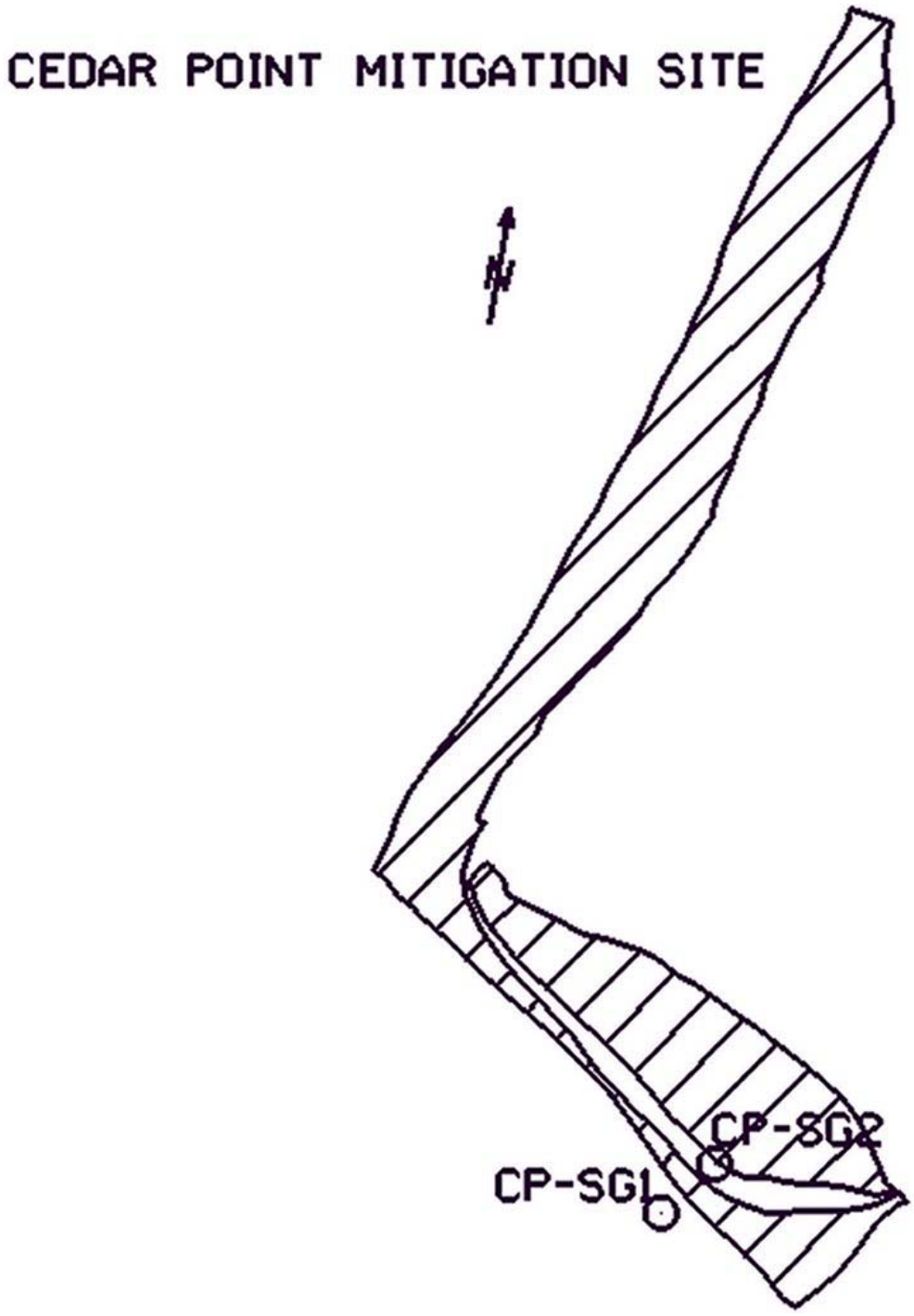


Figure 2. Gauge Location Map

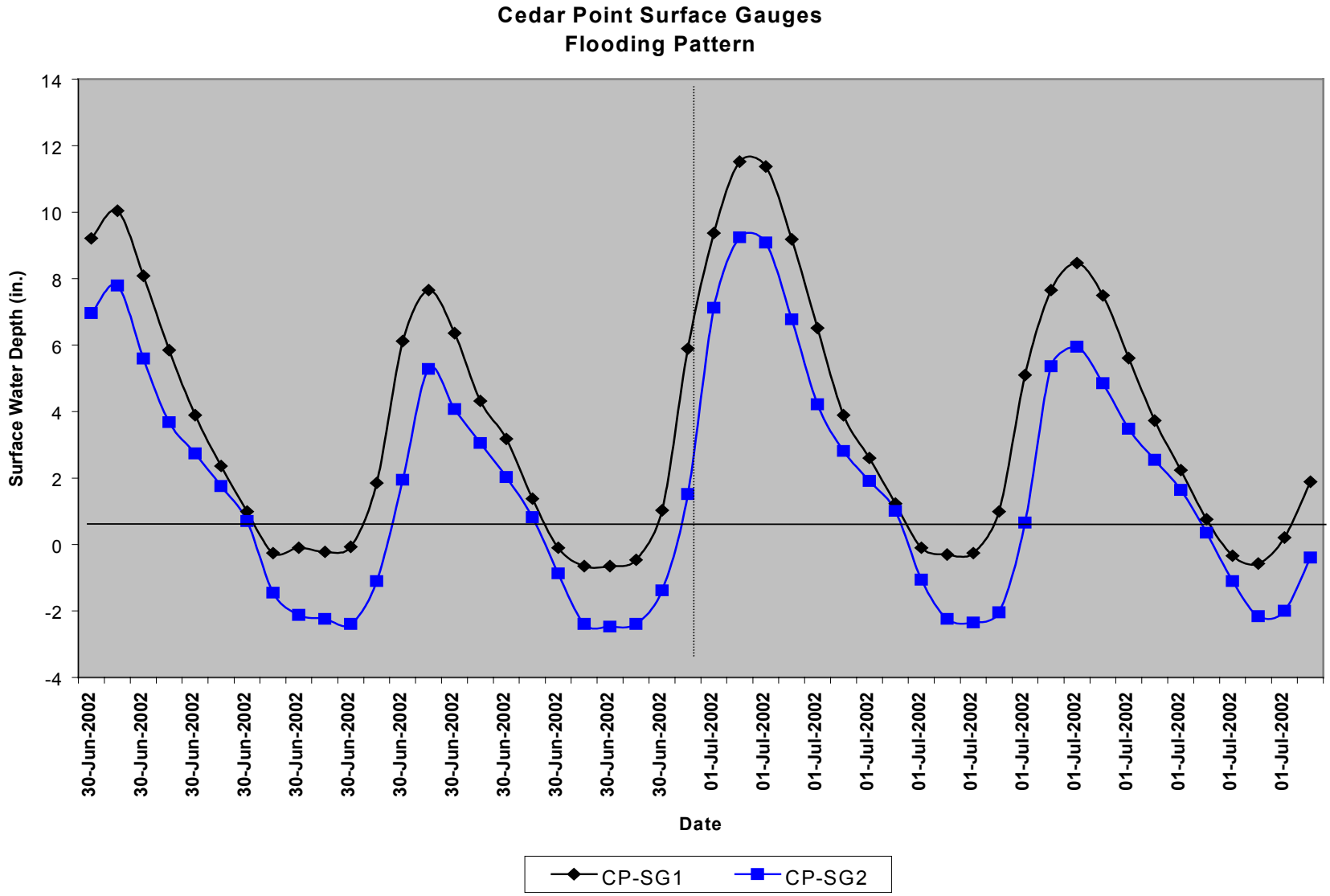


Figure 3. Plot of Daily Flooding Pattern (2-day period shown)

2.3.2 Climatic Data

Figure 4 is a comparison of 2001 and 2002 monthly rainfall to historical precipitation for the area. The two lines represent the 30th and 70th percentiles of monthly precipitation for Morehead City, NC. These percentiles represent monthly rainfall data collected between 1948 and 2002 that was provided by the State Climate Office of North Carolina at NC State University. Because of data availability, the 2002 rainfall encompasses precipitation through July 2002. The 2003 annual report will include a 30-70 percentile graph with the monthly rainfall from August through December of 2002.

The rainfall data collected at the Morehead City gauge shows rainfall totals that are slightly above average in March and July 2002. While the rest of 2002 experienced average rainfall conditions (except for April, which was below average), November and December 2001 both experienced below average rainfall. Thus for most of 2002, the site functioned within average climatic conditions. However, rainfall was never intended to be a primary hydrologic input for the site; thus it is expected that the site would show the required flooding regardless of area rainfall totals.

2.4 Conclusions

The surface gauge data gathered since monitoring began in June 2002 shows that the site is flooded twice daily, as is required in the mitigation plan. The site has shown consistent surface water present throughout the remainder of the growing season. Based on this initial data, hydrologic monitoring of the site will continue in 2003.

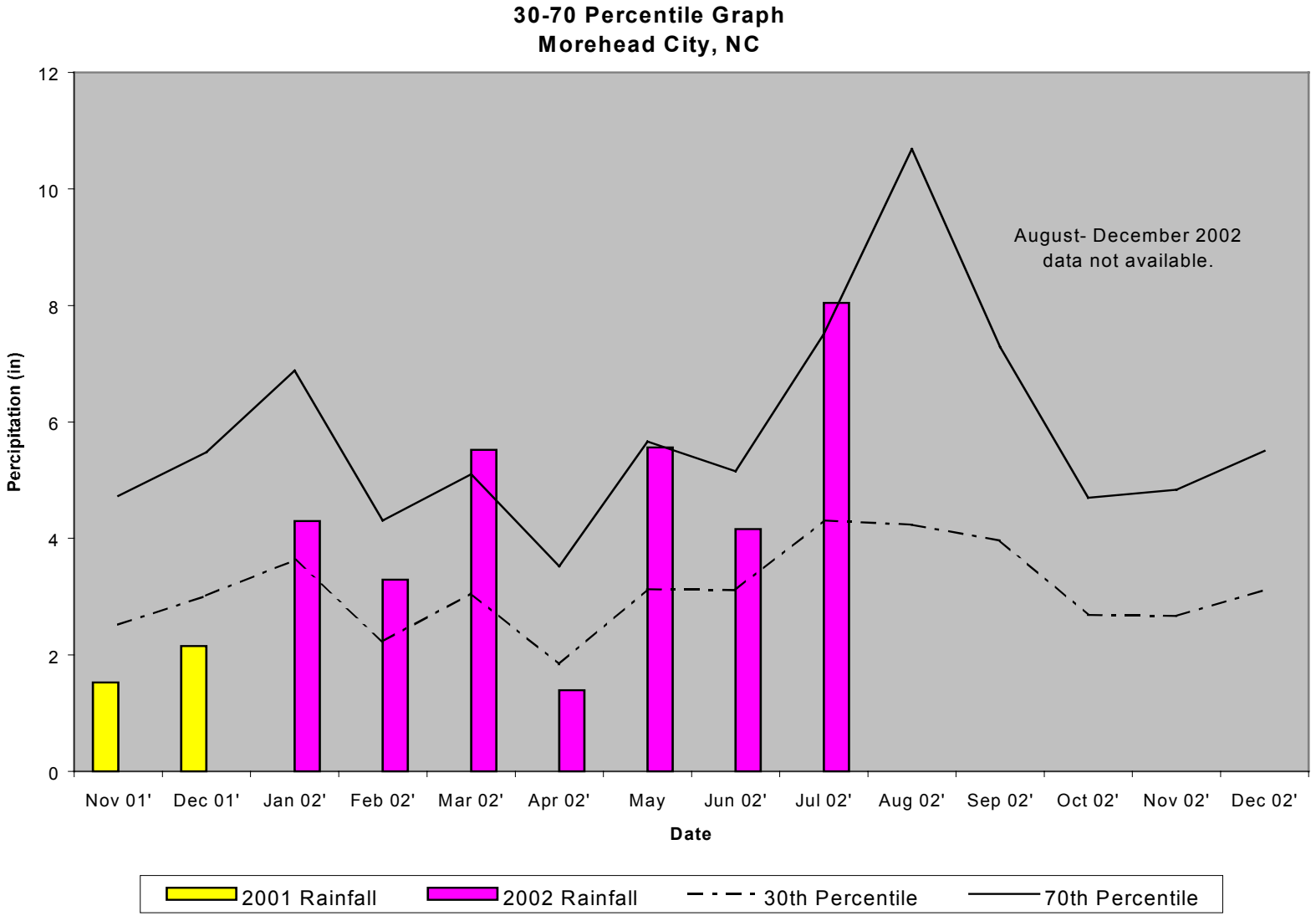


Figure 4. 30-70 Percentile Graph

3.0 VEGETATION

3.1 Success Criteria

The site will be considered a success if the calculated value for frequency is 0.5 and the calculated value for average percent cover is at least 80% by the end of the fifth growing season.

3.2 Description of Species

The following species were planted in the Wetland Restoration Area:

Spartina alterniflora, Smooth Cordgrass
Spartina patens, Salt Meadow Hay

3.3 Results of Vegetation Monitoring

The site was monitored in August 2002, and minimal planted vegetation was observed. Therefore, no values were calculated for frequency and percent cover.

3.4 Conclusions

The Cedar Point Mitigation Site does not currently meet vegetation success criteria. NCDOT plans to gather and test soil samples and to further evaluate the vegetation failure. The site is scheduled to be replanted in 2003.

4.0 OVERALL CONCLUSIONS/ RECOMMENDATIONS

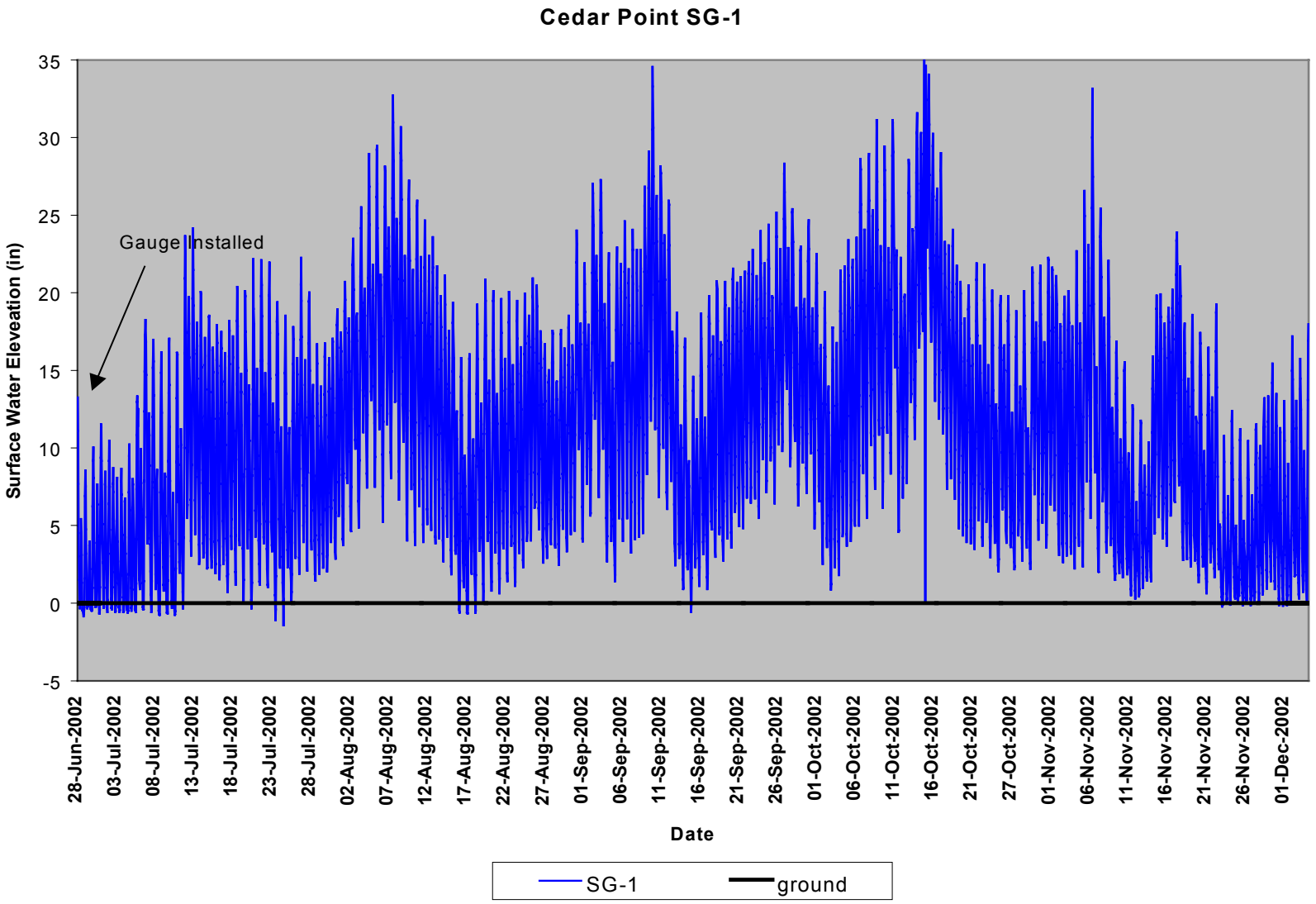
First year monitoring data indicates that the Cedar Point Mitigation Site, in terms of site hydrology, is functioning as expected. Data shows that the site is flooding twice daily, and consistent surface water is present at both surface water gauges throughout the growing season. Climatic data shows that the region experienced mainly average rainfall amounts.

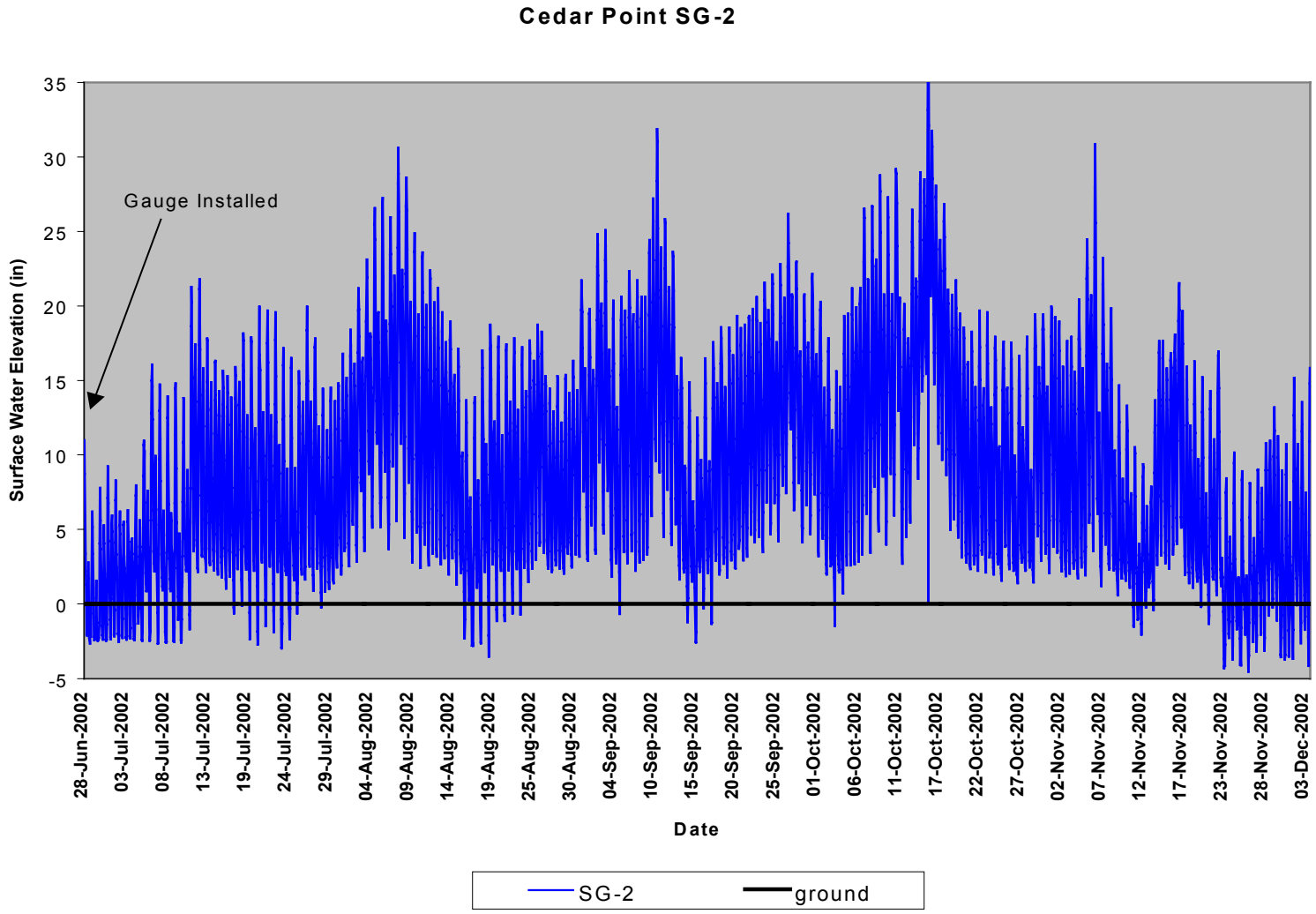
However, the initial vegetation monitoring yielded negative results. Minimal planted vegetation was observed at the first visit. An examination of the site will be conducted, and NCDOT has plans to replant the site once the investigation is complete.

Based upon these results, NCDOT recommends that hydrologic monitoring continue, and that vegetation monitoring begin again following replanting.

APPENDIX A

SURFACE WATER GAUGE GRAPHS


Cedar Point SG-1
Surface Water Eleveation (in)
35
30
25
20
15
10
5
0
-5
Gauge Installed
28-Jun-2002
03-Jul-2002
08-Jul-2002
13-Jul-2002
18-Jul-2002
23-Jul-2002
28-Jul-2002
02-Aug-2002
07-Aug-2002
12-Aug-2002
17-Aug-2002
22-Aug-2002
27-Aug-2002
01-Sep-2002
06-Sep-2002
11-Sep-2002
16-Sep-2002
21-Sep-2002
26-Sep-2002
01-Oct-2002
06-Oct-2002
11-Oct-2002
16-Oct-2002
21-Oct-2002
27-Oct-2002
01-Nov-2002
06-Nov-2002
11-Nov-2002
16-Nov-2002
21-Nov-2002
26-Nov-2002
01-Dec-2002
Date
SG-1
ground


Cedar Point SG-2
Surface Water Elevation (in)
35
30
25
20
15
10
5
0
-5
Gauge Installed
28-Jun-2002
03-Jul-2002
08-Jul-2002
13-Jul-2002
19-Jul-2002
24-Jul-2002
29-Jul-2002
04-Aug-2002
09-Aug-2002
14-Aug-2002
19-Aug-2002
25-Aug-2002
30-Aug-2002
04-Sep-2002
10-Sep-2002
15-Sep-2002
20-Sep-2002
25-Sep-2002
01-Oct-2002
06-Oct-2002
11-Oct-2002
17-Oct-2002
22-Oct-2002
27-Oct-2002
02-Nov-2002
07-Nov-2002
12-Nov-2002
17-Nov-2002
23-Nov-2002
28-Nov-2002
03-Dec-2002
Date
SG-2
ground

APPENDIX B

SITE PHOTOS AND PHOTO POINT LOCATIONS

Cedar Point

Photo 1

Photo 2

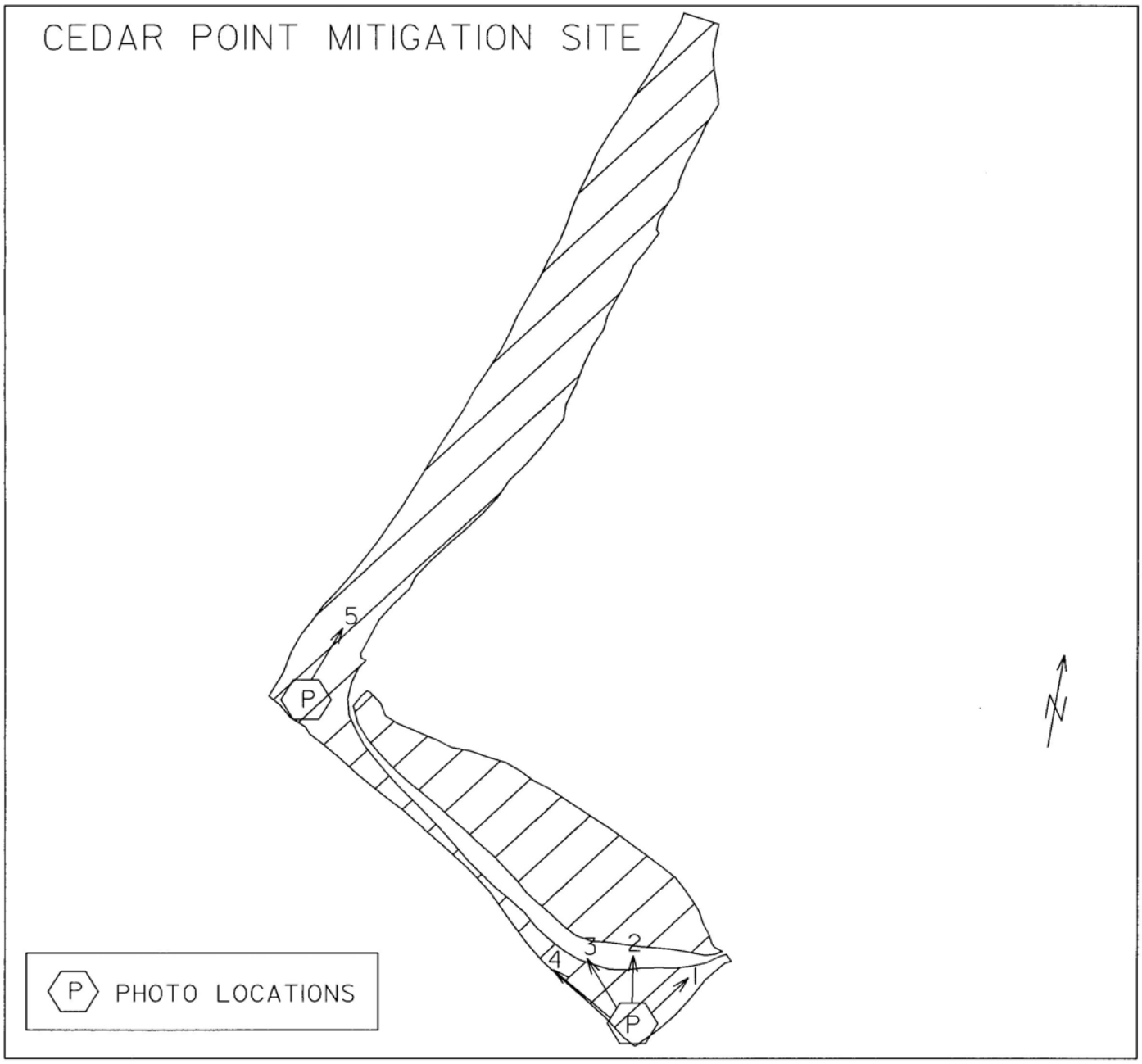
Photo 3

Photo 4

Photo 5

2002

Cedar Point



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